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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/978,096	10/17/2001	William J. Ooms	214975US99	4381

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EXAMINER

NGUYEN, CUONG QUANG

ART UNIT PAPER NUMBER

2811

DATE MAILED: 08/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/978,096

Applicant(s)

OOMS ET AL.

Examiner

Cuong Q Nguyen

Art Unit

2811

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 June 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 8-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 16-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2811

## **DETAILED ACTION**

### ***Election/Restriction***

1. Applicant's election with traverse of Embodiment I, claims 1-7 and 16-53 in Paper No. 5 is acknowledged. The traversal is on the ground(s) that the Office letter fails to state why the alternative method would be "another and materially different process" and the search and examination of an entire application can be made without serious burden. In Office letter filed on 2-8-02, Examiner clearly show that the claimed structure such as the insulating material can be formed by physical deposition instead of CVD, it is clearly establishing that the product as claimed can be made by a materially different process. Moreover, according to MPEP 802.01 that application including claims containing two distinct invention, Applicants have to elect only one of these invention. However, there is no evidence of record that the search and examination of an entire application including two distinct inventions can be made without serious burden for Examiner. NOTE: the linking claim "139" is a typo mistake and it should be claim 8.

The requirement is still deemed proper and is therefore made FINAL.

### ***Oath/Declaration***

2. The oath/declaration filed on 10/17/01 is acceptable.

Art Unit: 2811

***Information Disclosure Statement***

3. The Information Disclosure Statement filed on 10-17-01 has been considered.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16-17, 20-22, 24-28, 36-37, 41-42, 44-49, 51-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Onga et al. (US 5,514,904).

Regarding claims 16, 17, 26, 27, 28, 36, 37, 40, 46, 47, 53, Onga et al. discloses an integrated circuit having a varactor (a voltage variable thin film capacitor) comprising: a semiconductor substrate (204); a conductive electrode (205); and an insulating layer (201) formed between the second semiconductor layer and the electrode, wherein the insulating layer including substantially monocrystalline layer. See Onga et al.'s Fig.26C.

Regarding claims 20, 21, 41, 48, Onga et al. teaches that the monocrystalline insulating layer can be formed of metal oxide such as strontium titanate (SrTiO<sub>3</sub>). Col.18 lines 57-64.

Regarding claims 22, 42, 49, Onga et al. teaches that the insulating layer is substantially lattice matched to the semiconductor substrate. Col.8 lines 46-65.

Art Unit: 2811

Regarding claims 24, 44, 51, Onga et al. teaches that an interface layer formed between the insulating layer and the semiconductor substrate. Col.18 lines 65-67.

Regarding claims 25, 45, 52, an lower portion of layer (201) is considered as an interface layer and an upper portion of layer (201) is considered as the monocrystalline insulating layer.

The limitations “formed epitaxially” in claim 7, 28, 46, 53 is taken to be a product by process limitation, it is the patentability of the claimed product and not of recited process steps which must be established. Therefore, when the prior art discloses a product which reasonably appears to be identical with or only slightly different than the product claimed in a product-by process claim, a rejection based on sections 102 or 103 is fair. A product by process claim directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See *In re Fessman*, 180 USPQ 324,326(CCPA 1974); *In re Marosi et al.*, 218 USPQ 289,292 (Fed. Cir. 1983); and particularly *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product “gleaned” from the process steps, which must be determined in a “product by process ” claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claim in “product by process” claim or not.

Art Unit: 2811

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23, 43, 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onga et al.

Onga et al. teaches all the limitations of claims 16-17, 20-22, 24-28, 36-37, 41-42, 44-49, 51-53 as shown above and further teaches that the structure of insulating layer is rotated with respect to the structure of the semiconductor layer. However, Onga et al. does not explicitly teach that the structure of insulating layer is rotated approximately 45 degrees with respect to the structure of the semiconductor layer.

It would have been obvious to one of ordinary skill in the art to rotate the structure of insulating layer approximately 45 degrees with respect to the structure of the semiconductor layer as claimed because the rotated angle is an art recognized variable of importance which is subject to routine experimentation and optimization.

Claims 1-7, 18-19, 29-35, 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onga et al. in view of Cornett et al. (US 5,173,835).

Art Unit: 2811

Regarding claims 18, 19, 1-7, 38-39, Onga et al. substantially teaches all the limitations of claims 16-17, 20-28, 36-37, and 41-46 as shown above but does not explicitly teach a second semiconductor includes a material having a higher resistivity than the first semiconductor layer (the semiconductor substrate).

Cornett et al. discloses an integrated circuit having a voltage variable capacitor comprising: a first semiconductor layer (12); a second semiconductor layer (14, an epitaxial semiconductor layer) formed on the first semiconductor layer, wherein the second semiconductor layer including a material having a higher resistivity than the first semiconductor layer (col.2 lines 35-45); a conductive electrode (18); and an insulating layer (116) formed between the second semiconductor layer and the electrode. See Cornett et al.'s Fig.1.

Cornett et al. established that it is conventional to form second semiconductor including a material having a higher resistivity than the first semiconductor layer in the voltage variable capacitor structure. Therefore, it would have been obvious to one of ordinary skill in the art to form the second semiconductor (epitaxial layer) including a material having a higher resistivity than the first semiconductor layer as taught by Cornett et al. into Onga et al.'s device to serve as an area for a space-charge or depletion layer in order to make the voltage variable capacitor functioning. Cornett et al.'s col.2 lines 20-25.

Art Unit: 2811

Regarding claims 29-35, Onga et al. does not explicitly teach the voltage variable capacitor structure is a part of a radio circuit having a frequency dependent circuit.

It is conventional and also taught by Cornett et al. that the voltage variable capacitor is commonly formed in high frequency application such as a radio circuit. Cornett et al.'s col.4 lines 24-30.

It would have been obvious to one of ordinary skill in the art to incorporate the voltage variable capacitor into a radio circuit as taught by Cornett et al. in order to tune the center frequency of the radio circuit. Cornett et al.'s col.1 lines 30-40.

### ***Conclusion***

**6. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.**

**7. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is (703) 308-1293. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday.**



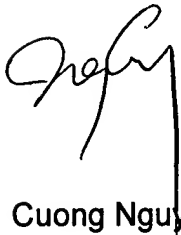
Serial Number: 09/978,096

Page 8

Art Unit: 2811

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor TOM THOMAS who can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722 or 308-7724.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center Receptionists whose telephone number is 308-0956.

A handwritten signature in black ink, appearing to read 'Cuong Nguyen', with a long vertical line extending downwards from the end of the signature.

Cuong Nguyen

August 21, 2002